Patent claims

1. A/D converter comprising a self-oscillating modulator, said converter comprising

at least one self-oscillating loop comprising

at least one forward path,

at least one feedback path,

wherein said at least one forward path comprises amplitude quantizing means combined with time quantizing means and outputting at least one time and amplitude quantized signal.

2. A/D converter comprising a self-oscillating modulator according to claim 1, wherein said time quantizing means is arranged within said self-oscillating loop.

3. A/D converter comprising a self-oscillating modulator according to claim 1 or 2, wherein said time quantizing means comprises a high-speed sampling means.

4. A/D converter comprising a self-oscillating modulator according to any of the claims 1-3,
wherein said time quantizing means comprises a high-speed one-bit sampler.

5. A/D converter comprising a self-oscillating modulator according to any of the claims 1-4,
wherein said time quantizing means comprises latch-based circuitry comprising at least one latch, preferably at least two cascaded latches.

6. A/D converter comprising a self-oscillating modulator according to any of the claims 1-5,

wherein said amplitude quantizing means and said time quantizing means comprises a multi-bit A/D converter and where said feedback path comprises at least one D/A converter adapted for converting said time quantized signal into an analogue signal.

7. A/D converter comprising a self-oscillating modulator according to any of the claims 1-6,
wherein down sampling means are connected to said time quantizing means.

8. A/D converter comprising a self-oscillating modulator according to any of the claims 1-7,
wherein said A/D converter comprises two or more self-oscillating loops (SOL).

9. A/D converter comprising a self-oscillating modulator according to any of the claims 1-8,
wherein said amplitude time quantizing means comprises an analogue two-level self-oscillating pulse width modulator.

10. A/D converter comprising a self-oscillating modulator according to any of the claims 1-9,
wherein said amplitude time quantizing means comprises a multi-level self-oscillating pulse width modulator.

11. A/D converter comprising a self-oscillating modulator according to any of the claims 1-10,
wherein said A/D converter is single-ended.

12. A/D converter comprising a self-oscillating modulator according to any of the claims 1-11,
wherein said A/D converter is differential.

13. A/D converter comprising a self-oscillating modulator according to any of the claims 1-12,
wherein said A/D converter comprises filtering means, said filtering means adapted for band pass filtering the time quantized signal.

14. A/D converter comprising a self-oscillating modulator according to any of the claims 1-13, wherein the error originating from at least one time quantizer included in the at least one self-oscillating loop of the converter is suppressed by an error transfer function which, at low frequencies approximates the inverse of the open-loop transfer function of said at least one self-oscillating loop.

15. A/D converter comprising a self-oscillating modulator according to any of the claims 1-14, wherein the error originating from at least one time quantizer included in the at least one self-oscillating loop of the converter is suppressed by an error transfer function which, at high frequencies approximates 0 dB.

16. A/D converter comprising a self-oscillating modulator according to any of the claims 1-15,
wherein said amplitude quantizing means comprises a limiter.

17. A/D converter comprising a self-oscillating modulator according to any of the claims 1-16, wherein said amplitude quantizing means comprises a frequency compensated limiter.

18. A/D converter comprising a self-oscillating modulator according to any of the claims 1-17,
wherein a variable self-oscillating loop delay is applied.

19. A/D converter comprising a self-oscillating modulator according to any of the claims 1-18, wherein a variable delay in the feedback path.

20. A/D converter comprising a self-oscillating modulator according to any of the claims 1-19, wherein a transfer function H(s) is inserted in the forward path, thereby at least partly controlling the switch-frequency.

21. Method of performing a A/D-conversion comprising the steps of representing a pulse width modulated representation as an analogue signal and quantizing the pulse width modulation in the time-domain.

22. Method of performing an A/D-conversion according to claim 21, whereby said pulse width modulated representation is obtained by means of at least one self-oscillating modulator comprising at least one self-oscillating loop.

23. Method of performing an A/D-conversion according to claim 21 or 22, whereby said quantization in the time domain is performed within said at least one self-oscillating loop.

24. Method according to any of the claims 21-23, whereby said method is applied in an A/D converter according to any of the claims 1-20.